

## **POUCH HAVING EXPANDED POLYMER EDGES**

### **Field of the Invention**

**[0001]** The present invention relates generally to flexible packaging in the form of pouches and methods of making pouches. Specifically the invention relates to flexible pouches with an improved edge configuration.

### **Background of the Invention**

**[0002]** Flexible pouch type packaging is typically created by heat sealing two adjacent plies of thermoplastic material along an outer perimeter edge.

**[0003]** Using current heat sealing technology, flexible pouches are sometimes formed having relatively sharp edges. The edges may particularly be sharp when the pouch construction includes heavy-gauge oriented polymers and/or foil. Sharp edges may make the pouches difficult to handle for the manufacturer as well as the consumer. In some situations, the manufacturer is required to package the pouches within secondary packaging to prevent the edges from cutting or scaring other packages during shipment. The application of this secondary packaging is time consuming and adds cost, as well as may reduce the number of pouches that can be shipped in a given package.

**[0004]** There are a number of known methods of heat sealing pouch seams. U.S. Pat. No. 3,256,527 to Struden discloses a manner of heat sealing of a seam by passing the material between heated jaws having a planar surface for contacting the layers. The resulting seam is a flat, fin-type seam of two layers. U.S. Pat. No. 4,868,025 to Strzelewicz discloses a manner

of heat sealing a seam by passing the material between jaws specially designed to produce a zone of fused materials, forming a seamed edge on the bag.

**[0005]** It is also known to use heat activated puff ink in a variety of contexts. U.S. Pat. No. 4,448,320 to Kapolas discloses a closure for a rigid container (e.g., a jar) that utilizes a liner formed of plastisol that expands when cured. The plastisol bead is indicated to aid in retaining the closure of the container. U.S. Pat. No. 5,873,641 to Spinelli discloses puff ink on a flat, non-woven textile mat. The puff ink provides graphics and a non-skid surface. U.S. Pat. No. 5,133,088 to Dunlap discloses a sock having puff ink applied thereon, that provides a non-skid surface.

### **Summary of the Invention**

**[0006]** The present invention relates in general to a flexible pouch of the type having two adjacent panels, with each panel comprises a single layer or a plurality of layers laminated together. An expandable polymer is positioned between two of the layers, adjacent the edges.

**[0007]** The expandable polymer, as contemplated by the present invention, is a specifically triggered, such as by heat, radio frequency or the like, meaning that the polymer does not expand on its own. Preferably, the expandable polymer is a heat-activated puff ink. One potential form of trigger is the activation of microspheres in the polymer, which cause the polymer to expand. The expandable polymer may be applied to the pouch layers as part of the printing process for the layers.

**[0008]** The pouch may be formed in any number of configurations. One possible form includes two adjacent panels and a bottom gusset, wherein the two panels and the bottom gusset may comprise a plurality of laminate layers. In this pouch embodiment, the expandable polymer may be positioned between two of the plurality of layers adjacent the edges in both side panels, in one of the side panels and the bottom gusset, or in both side panels and the bottom gusset. The two side panels, or the one side panel and the bottom gusset, are heat sealed together along at least one edge. In the preferred embodiment, the heat sealing activates the expandable polymer, causing the polymer to expand outwardly

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along the edge of the panels and/or gusset. The outwardly expansion of the polymer forms a bead of tactile friendly material.

**[0009]** It is contemplated that the expandable polymer may be a material that does not expand during the heat sealing operation. The polymer material extrudes outwardly after the heat sealing by using a specific trigger other than heat, such as by the application, electron beams or microwaves.

#### **Brief Description of the Drawings**

**[0010]** For the purpose of illustrating the invention there is shown in the drawings various forms which are presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities particularly shown.

**[0011]** **Fig. 1** is a top perspective view of a pouch with a bead formed along the edges by an expanded polymer material.

**[0012]** **Fig. 2** is a partial cross section of the two adjacent multi-layered laminate panels with expandable polymer positioned between two of the layers.

**[0013]** **Fig. 3A** is a top plan view of two pouch panels after being heat sealed and prior to the expansion of the polymer.

**[0014]** **Fig. 3B** is a top plan view of the pouch in **Fig. 3A** after the polymer has expanded, creating a bead along the edges.

**[0015]** **Fig. 4A** is an elevation view of a heat sealed pouch prior to the expansion of the polymer.

**[0016]** **Fig. 4B** is an elevation view of the pouch showing the expanded polymer having created a bead along the edges of the pouch.

### Detailed Description of the Invention

[0017] With reference to the drawings, where like numerals identify like elements, there is shown in FIG. 1 a pouch in accordance with the present invention, which is generally identified by the numeral 10. The pouch 10 is formed by the joining a front panel 12 and back panel 14 along two edge seams 16 and along one bottom edge seam 18. As illustrated, an expandable polymer 20 has formed a bead 22 along the joined edges 16, 18 of the pouch. This bead of expanded polymer 22 covers the outer edges of the pouch and provides a relatively soft edge.

[0018] As shown in FIG 2, the polymer 20 in its unexpanded state is positioned along the edges of the pouch panels 12, 14, between two laminate layers 24, 26. In the preferred embodiment, the polymer 20 comprises plastisol based, heat-activated puff ink, which is printed in register with the graphics on one of the panels during normal printing process (e.g. by a flexographic or gravure process). Each panel may be formed of a single layer or may be made from any number of laminate layers 28. As shown in Fig. 2, the laminate layers 24, 26, 28 may comprise heavy gauge polymers, such as polyethylene terathale or foils. The polymer 20 during its expansion is extruded outwardly from between the layers, when the edges of the pouch are heat sealed by sealing jaws 30. The sealing jaws 30 are preferably chamfered along the outer edge of the pouch so as to assist in the extrusion of the polymer 20 in an outward direction during the expansion.

[0019] FIG. 3A shows a pouch with heat sealed side edges 16 and the polymer 20 remaining in the unexpanded state between two of the laminate layers 24, 26, both on the front 12 and back 14 panels. FIG. 3B shows a pouch with an expanded polymer bead 22 positioned along the heat sealed edges 32 of the pouch. The expansion of polymer 20 in this embodiment is not triggered by the heat sealing process; rather, the expansion is triggered by an alternate means, such as by electron beam, microwave, etc.

[0020] FIG. 4A shows the pouch in cross section, wherein the front panel 12 is the heat sealed 34 around three side edges. In this figure, the polymer 20 remains in the laminate

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layers after the heat sealing, since expansion is triggered by something other than heat. A cross section of the pouch with the polymer in the expanded condition, triggered by heat, electron beam, microwave, or the like, is shown in FIG. 4B.

[0021] FIG. 5 shows an alternate pouch form 36 having a front panel 12, a back panel 14 and a bottom gusset 38. The front panel 12 and back panel 14 are joined along two edge seams 16. The bottom gusset is joined to the front panel and the back panel along edge seams 40, 42. A bead of expandable polymer 22 is formed along the heat sealed edges of the pouch 16, 40, 42.

[0022] The expanded polymer as contemplated by the present invention may define tactile friendly surfaces. The preferred construction of a puff ink as the expandable polymer creates this quality. However, other features of the invention will be understood by those in the art upon review of the present specification.

[0023] It will be appreciated by those skilled in the art, that the present invention may be practiced in various alternate forms and configurations. The previously detailed description of the preferred embodiments are presented for purposes of clarity of understanding only, and no unnecessary limitations should be implied there from.